PEACE/WILLISTON
FISH & WILDLIFE
COMPENSATION
PROGRAM

BC hydro

BRITISH
COLUMBIA

A Reconnaissance Survey of Unnamed Lake (West Nabesche Lake)

M. J. Hunter
March 1997

PWFWCP Report No. 162

105-02089/

The Peace/Williston Fish & Wildlife Compensation Program is a cooperative venture of BC Hydro and the provincial fish and wildlife management agencies, supported by funding from BC Hydro. The Program was established to enhance and protect fish and wildlife resources affected by the construction of the W.A.C. Bennett and Peace Canyon dams on the Peace River, and the subsequent creation of the Williston and Dinosaur Reservoirs.

Peace/Williston Fish and Wildlife Compensation Program, 1011 Fourth Ave. 3rd Floor, Prince George B.C. V2L 3H9

Website: *www.bchydro.bc.ca/environment/initiatives/pwcp/*

This report has been approved by the Peace/Williston Fish and Wildlife Compensation Program Fish Technical Committee.

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A RECONNAISSANCE SURVEY OF

UNNAMED LAKE (WEST NABESCHE LAKE)

WATERSHED:	**Williston Reservoir (Peace Reach)**
DATE OF SURVEY:	**September 13 -14,1996**
FIELD CREW LEADER:	**Mark Hunter**
FIELD ASSISTANT:	**Karin Mathias**
REPORT PREPARED BY:	**Mark Hunter**

BRITISH COLUMBIA CONSERVATION FOUNDATION

PEACE / WILLISTON FISH AND WILDLIFE COMPENSATION PROGRAM

B. C. MINISTRY OF ENVIRONMENT, LANDS AND PARKS

FUNDED BY: FOREST RENEWAL BRITISH COLUMBIA

RELEASED BY: _____

D. J. Cadden, Regional Fisheries Biologist

LAKE: Unnamed Lake (W. Nabesche Lake) SYSTEM NAME: W. Nabesche River

A.S.A.P. REFERENCE NO.: **`WATERSHED CODE: 230-8606-691**

DATA ON FILE FOR THIS SURVEY

Location	X	Dissolved 02 / Temp. Profiles	X
Physical Data	X	Winter Dissolved 02 / Temp. Profiles	--
Bench Mark	X	Netting Record	X
Terrain Features		Lake Catch Summary	X
Access		Individual Fish Data	X
Resorts and Campsites	X	Fish Preserved	--
Other Developments	X	Stomach Analysis	X
Obstructions and Pollutions	X	Scale Reading	X
Special Restrictions	X	Location of Inventory Sites	X
Aquatic Plants	X	Photograph Directory	X
Wildlife Observations	X	Appendices	
Miscellaneous Comments	X	A: Water Chemistry Analysis	X
Lake Drainage	X	B: Tributary Stream Data	X
Fisheries Management Comments	X	C: Fish Scale Analysis	X
History of Previous Surveys	X	Bathymetric Map Reduction	X
Water Chemistry Summary	X	Bathymetric Map	X

LOCATION

Location:	approximately 102 km north-northwest of Mackenzie		
Elevation:	1425m ± 25m	U.T.M.:	10.470417.6230723
Latitude / Longitude:	56°13'14" 23°28'37"	N.T.S. Map No.:	94 - B / 3
Management Unit:	7-36	Biogeoclimatic Zone:	Engleman Spruce - Sub-Alpine Fir
Ecoprovince:	Sub-Boreal Interior	Ecoregion:	Central Canadian Rocky Mountains
Ecosection:	Misinchinka Ranges		

Drainage: Unnamed C. --> West Nabesche R. --> Nabesche R. --> Williston Reservoir (Peace Arm) --> Peace **R.**

PHYSICAL DATA

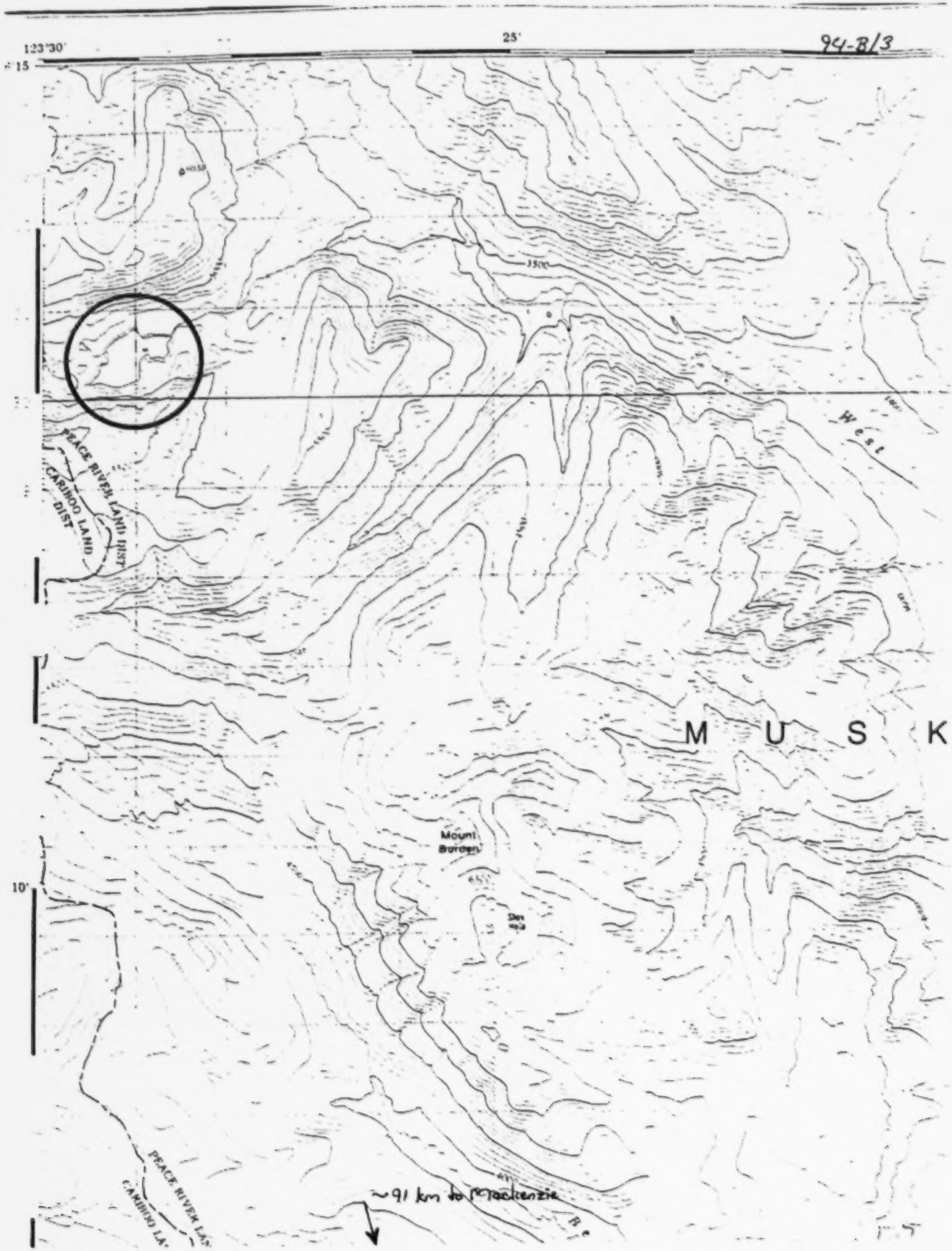
Lake Drainage Area:	4.5 km^2	Volume:	1 818 352 m^3
Water Surface Area:	308 314 m^2	Perimeter of Islands:	260 m
Area Above 6 m Contour:	165 090 m^2	Number of Islands:	1
Shoreline Perimeter:	3 050 m	Mean Depth:	6.1 m
Maximum Depth:	22.6 m	Secchi Reading:	16.9m
Filterable Residue (TDS):	90 mg/L		

Sounding Device: Lowrance X-15 Elevation Source: Contour Interpolation

BENCHMARK

(Iron spike, center of red circle) located 2.0 m above present water level in a 16 cm diameter fir tree that is 5.0 m from the present water's edge and located approximately 150 m north of Inlet # 1 (Plate # 5).

High Water Mark: 0.7 m above water level at time of survey


123°30'
25'
94-B/3
15'
10'
PEACE RIVER LAND DIST
CARIBOO LAND DIST
M U S K
Mount Burden
~91 km to Mackenzie
PEACE RIVER LAND
CARIBOO LA

LAKE: Unnamed Lake (West Nabesche Lake)

TERRAIN FEATURES

Immediate Shoreline:

Except for the southeast shoreline, West Nabesche Lake is surrounded by a low sloped beach that is composed of gravels and cobbles with an occasional boulder and some sedge grasses. Grasses and shrubs grow just back from the lake. Behind the beach front is a forest of subalpine fir. The southeast shoreline is a steep scree slope of cobbles and boulders off the adjacent mountain side, with bedrock along the north-running shoreline of the lake just east of the scree slope. The shoreline substrate is composed of gravels and cobbles, with some boulders along the scree slope on the southeast side of the lake. The island's shoreline is a low sloped gravels and cobble beach with grasses, shrubs and a few alpine fir trees growing just beyond the beach front. The lake's bottom drops off slowly in the west end of the West Nabesche Lake, around the island and along the north side of the lake. In front of the scree slope and bedrock area, the lake's bottom drops off rapidly towards the lake's center. There is a shallow shoal between the island and the south shore of the lake.

Surrounding Country:

West Nabesche is surrounded by a mature forest of subalpine fir growing on the moderately low slopes of a sub-alpine valley situated between mountains to the north, south and west. To the east, the terrain has a moderately steep slope as it drops away from the lake. To the west of the lake, there are three ponds that form the headwaters of this system. West Nabesche Lake is situated within the Engleman Spruce - Subalpine Fir biogeoclimatic zone.

LAKE: Unnamed Lake (West Nabesche Lake)

ACCESS

Directions:

West Nabesche Lake is approximately a 20 minute helicopter ride southeast from Ospika Camp. Ospika Camp, operated by Timber West, is most easily reached by flying out of Mackenzie on one of the local airlines and having the gear barged up to the camp by Finlay Navigation Inc.

Road Type and Conditions:

N/A

Restrictions:

None known.

RESORTS AND CAMPSITES

There are no resorts or campsites on West Nabesche Lake.

OTHER DEVELOPMENTS

None noted.

OBSTRUCTIONS AND POLLUTIONS

The outlet to West Nabesche Lake only runs during spring flood or during periods of very heavy rain. At the time of survey, the lake level would have had to rise approximately 0.5 m before water would flow freely into the outlet creek's channel bed. Water did seep underground and emerge approximately 80 m downstream of the lake.

LAKE: Unnamed Lake (West Nabesche Lake)

SPECIAL RESTRICTIONS

None known.

AQUATIC PLANTS

The following aquatic plants were identified during the time of the survey:

sedge grasses aquatic mosses

WILDLIFE OBSERVATIONS

The following wildlife or signs were seen during the time of the survey:

12 unidentified ducks moose tracks

MISCELLANEOUS COMMENTS

1) Although West Nabesche Lake is a very beautiful lake with majestic surroundings, it can only be easily reached by helicopter. Therefore, access limitations may preclude developments on this lake in the near future.

2) The outlet does not run all year round. At the time of the survey, the lake level would have had to rise approximately 0.5 m before water would freely run into the Outlet.

3) West Nabesche Lake has extremely clear water, with visibility reaching 16.9 m (measured with a secchi disc).

4) Bathymetric map: The lake outline was drawn from an enlargement of air photo 30 BCB 93066: No. 211, flown August 20, 1993.

LAKE: Unnamed Lake (West Nabesche Lake)

LAKE DRAINAGE

General:

West Nabesche Lake is fed by one inlet that enters the lake in the west corner. During times of high water, the lake is drained to the east by an unnamed creek that flows for approximately 3.8 km before it joins the West Nabesche River. The West Nabesche River runs southeast for approximately 26.5 km to it's confluence with the Nabesche River. During most of the year, the first 80 m of the outlet creek appears to be dry.

Major Systems:

There are no major systems.

Minor Systems:

Inlet # 1 - Unnamed Creek

Inlet # 1 enters West Nabesche Lake in the west comer of the lake (Plate # 6). The first 25 m of the creek has an average wetted width of 4.0 m and depth of 0.3 m. The substrate is fines, angular large gravels and cobbles with some boulders, and flows between banks composed of gravels and cobbles and overgrown by mosses and willows. Approximately 25 m upstream of the lake, the channel goes underground to flow through the stream bed. Approximately 60 m upstream, the water flow resurfaces at the base of a 20 m high bedrock cliff that has a trickle of water flowing down it; this would be an impassable falls when water runs over the cliff (Plate # 7). At the top of the cliff, there is water in the channel. Approximately 100 m upstream of West Nabesche Lake, there is a 10 m high falls over a bedrock cliff face. Approximately 130 m upstream of the lake, there is a large pond, approximately 130 m by 120 m, that feeds Inlet # 1. The water temperature was 5.5 °C at the time of the survey. After a night of rain, the amount of water flowing over the large falls located approximately 60 m upstream of the lake increased (Plate # 8). Inlet # 1 offered some rearing habitat, but contained no spawning habitat during the survey period.

Outlet - Unnamed Creek

The outlet drains West Nabesche Lake from the east end of the lake during periods of high flow, such as during snow melt (Plate # 9). At the time of the survey, the lake level would have had to rise approximately 0.5 m before water would freely flow down the outlet directly from the lake. The channel bed has an average width of 3.0 m and is composed of partially moss-covered cobbles and boulders with some large gravel (Plate # 10). The first 45 m has a low gradient; approximately 45 m downstream of the lake, the channel gradient increases to 7%. Approximately 80 m downstream of West Nabesche

LAKE: Unnamed Lake (West Nabesche Lake)

Lake, water seeps through the channel bed and creates a flowing creek (Plate # 11). The water temperature was 9 °C at the time of the survey. The outlet offered some good rearing habitat, but contained no spawning habitat during the survey period.

FISHERIES MANAGEMENT COMMENTS

West Nabesche Lake appears to be barren of all fish species. As well, there is no spawning habitat found in Inlet # 1 or in the outlet. If the lake was to be stocked, a

continuous program would have to be implemented.

HISTORY OF PREVIOUS SURVEYS

Lake Surveys:

None known.

Other Related Studies:

None known.

LAKE: Unnamed Lake (West Nabesche Lake)

WATER CHEMISTRY SUMMARY Limnology Station No. 1

Field Conditions:

Date:	Sept. 13, 1996		
Time:	1215 hrs	Air Temperature:	14.0 °C
Wind Velocity:	0 km/h	Wind Direction:	N/A
Cloud Cover:	9 / 10 o.c.	Surface Conditions:	flat
Secchi Disc:	16.9 m	Water Colour:	turquoise and clear

Method Used:

Dissolved Oxygen:	YSI Model 57 Oxygen / Temperature Meter
Water Temperature:	YSI Model 57 Oxygen / Temperature Meter
Air Temperature:	Hand-Held Alcohol Thermometer
pH (field):	Digital pH Pocket Tester
H2S (field):	Hach H2S Field Test Kit
Laboratory Used:	Pacific Environmental Science Center
Water Sampler:	Vertical Alpha Water Bottle (Vandorn)
Metal Sampler:	By Hand; Preserved With 2.0 mL Nitric Acid
Substrate Sampler:	Substrate Sample Not Taken

Water Sample Chemistry: **SEAM Site No.:** E 223191

	Sampling Depths	
	Surface (0.5 m)	Lower (20.5 m)
Alkalinity (lab)	78.4 mg / L	87.4 mg / L
Filterable Residue 105°C (lab)	90 mg / L	100 mg / L
H2S (field)	N/A	0 mg / L
Nitrogen - Total (lab)	0.09 mg / L	0.14 mg / L
Non-Filterable Residue (lab)	< 5 mg / L	< 5 mg / L
pH (field)	8.3	8.5
pH (lab)	8.24	8.07
Phosphorus - Total Dissolved (lab)	< 0.002 mg / L	< 0.002 mg / L
Specific Conductance (lab)	148 µS / cm	176 µS / cm

Bottom Depth: 21.6 m

Substrate Sample Depth: N/A

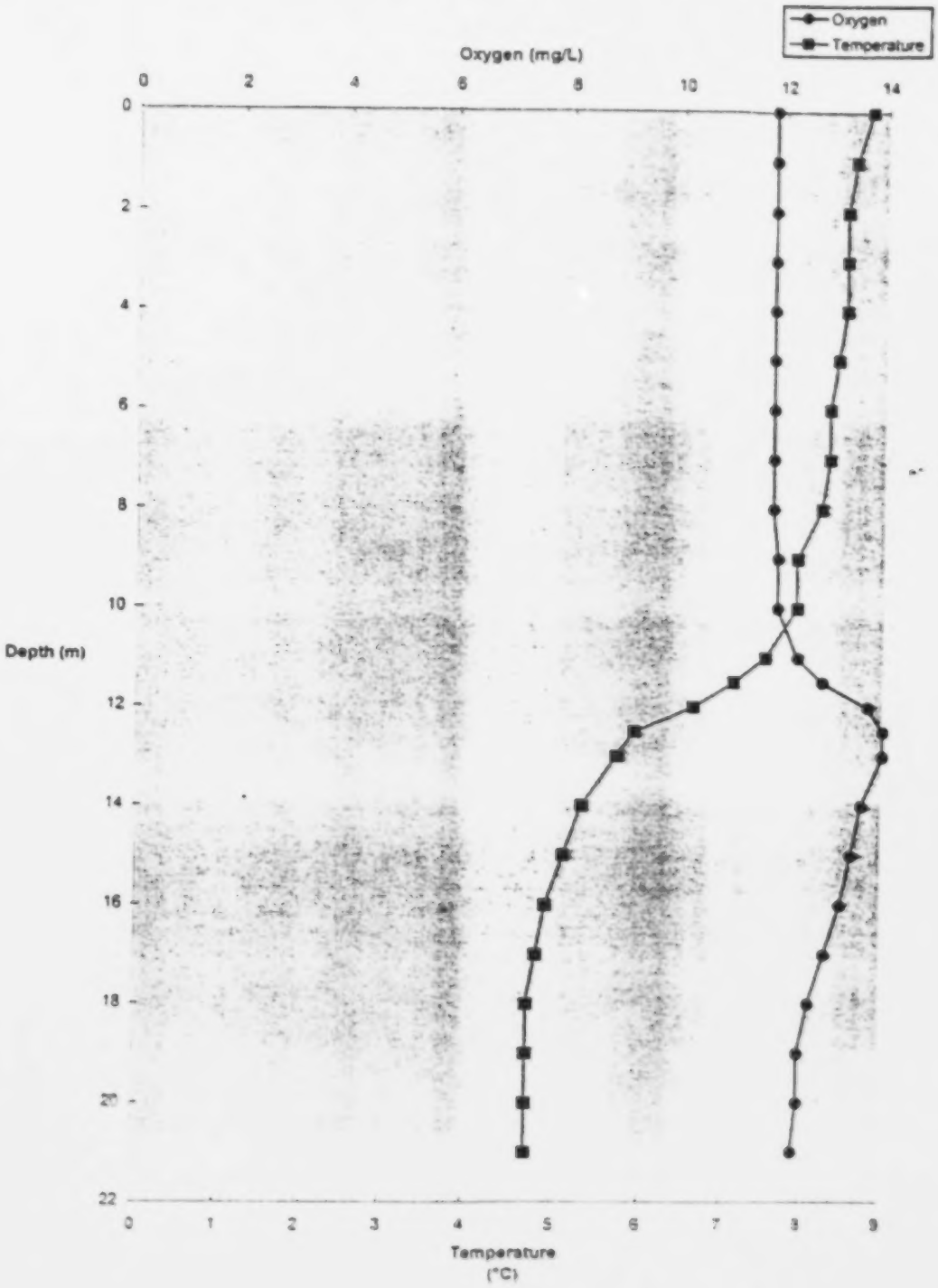
* additional analyzed parameters and results, including metals, are found in Appendix 1

LAKE: Unnamed Lake (West Nabesche Lake)

SUMMER OXYGEN / TEMPERATURE DATA

DEPTH (m)	02 (mg/L)	TEMPERATURE (°C)
Surface	11.8	8.8
1.0	11.8	8.6
2.0	11.8	8.5
3.0	11.8	8.5
4.0	11.8	8.5
5.0	11.8	8.4
6.0	11.8	8.3
7.0	11.8	8.3
8.0	11.8	8.2
9.0	11.9	7.9
10.0	11.9	7.8
11.0	12.3	7.5
11.5	12.8	7.1
12.0	13.7	6.6
12.5	14.0	5.9
13.0	14.0	5.7
14.0	13.6	5.3
15.0	13.4	5.1
16.0	13.2	4.9
17.0	12.9	4.8
18.0	12.6	4.7
19.0	12.4	4.7
20.0	12.4	4.7
21.0	12.3	4.7
21.6	Bottom	

SUMMER OXYGEN / TEMPERATURE PROFILE



LAKE: Unnamed Lake (West Nabesche Lake)

NETTING RECORD

Mesh Size Experimental Order: 25, 76, 51, 89, 38, 64 mm

NETTING SITE # 1

Type:	Sinking Monofilament Gill Net		
Date Set:	Sept. 13, 1996	Time:	1750 hrs
Date Lifted:	Sept. 14, 1996	Time:	0820 hrs
Net Dimensions:	Length: 91.4 m	Depth:	2.4 m
Shallow End Mesh Size:	25 mm	Depth:	1.3 m
		Substrate:	cobbles / boulders
Deep End Mesh Size:	64 mm	Depth:	12.5 m
		Substrate:	fines over cobbles / boulders

Comments: Net empty.

LAKE CATCH SUMMARY

Minnow Traps:

Bait: Sardines

Trap No.	Hours	Depth (m)	Substrate	Species	No. Caught	Size Range (cm)
1	14:55	1.0	fines / gravels	empty	0	-
2	14:54	1.2	fines/ gravels/ cobbles	empty	0	-
3	14:54	1.1	cobbles / boulder	empty	0	-
4	14:55	1.0	cobbles / boulder	empty	0	-

LOCATION OF INVENTORY SITES
Benchmark
Stream Number And Direction Of Flow
NS Net Set Number And Site
LS Limnostation Number And Site
Plate Number And Direction Of Photograph
1
2
3
4
5
6
NS1
LS

LAKE: Unnamed Lake (West Nabesche Lake)

PHOTOGRAPH DIRECTORY

Plate	Roll : Number	Description
1	29: 23	Aerial view of Unnamed Lake (West Nabesche Lake) looking west.
2	29: 19	Aerial view of the three ponds upstream of Unnamed Lake (West Nabesche Lake) that form of the headwaters of this system.
3	27:17 - 19	Panoramic view of Unnamed Lake (West Nabesche Lake) looking east from the center of the lake.
4	27: 14 - 16	Panoramic view of Unnamed Lake (West Nabesche Lake) looking west from the center of the lake.
5	27: 4	View of the benchmark located 2.0 m above present water level in a 16 cm diameter fir tree that is 5.0 m from the present water's edge and located approximately 150 m north of Inlet # 1.
6	27: 13	View of the mouth of Inlet # 1 where it enters Unnamed Lake (West Nabesche Lake) in the west corner of the lake.
7	27: 11	Upstream view of bedrock fall # 1 on Inlet # 1, located approximately 60 m upstream of Unnamed Lake (West Nabesche Lake).
8	27: 3	Upstream view of bedrock falls # 1 on Inlet # 1, located approximately 60 m upstream of Unnamed Lake (West Nabesche Lake) after a night of rain. Note the amount of flow compared to Plate # 11.
9	27: 20	View of the mouth of the outlet where it drains Unnamed Lake (West Nabesche Lake) from the east end of the lake during times of high water. Note that the lake level would have to rise approximately 0.5 m before water would freely run down the creek channel.
10	26: 1	Downstream view of the dry channel bed of the outlet, taken approximately 50 m downstream of Unnamed Lake (West Nabesche Lake).
11	27: 24	Downstream view of the outlet, taken approximately 85 m downstream of Unnamed Lake (West Nabesche Lake). Note that there is now surface flow in the channel.

LAKE: Unnamed Lake (West Nabesche Lake)

Plate # 1: Aerial view of Unnamed Lake (West Nabesche Lake) looking west.

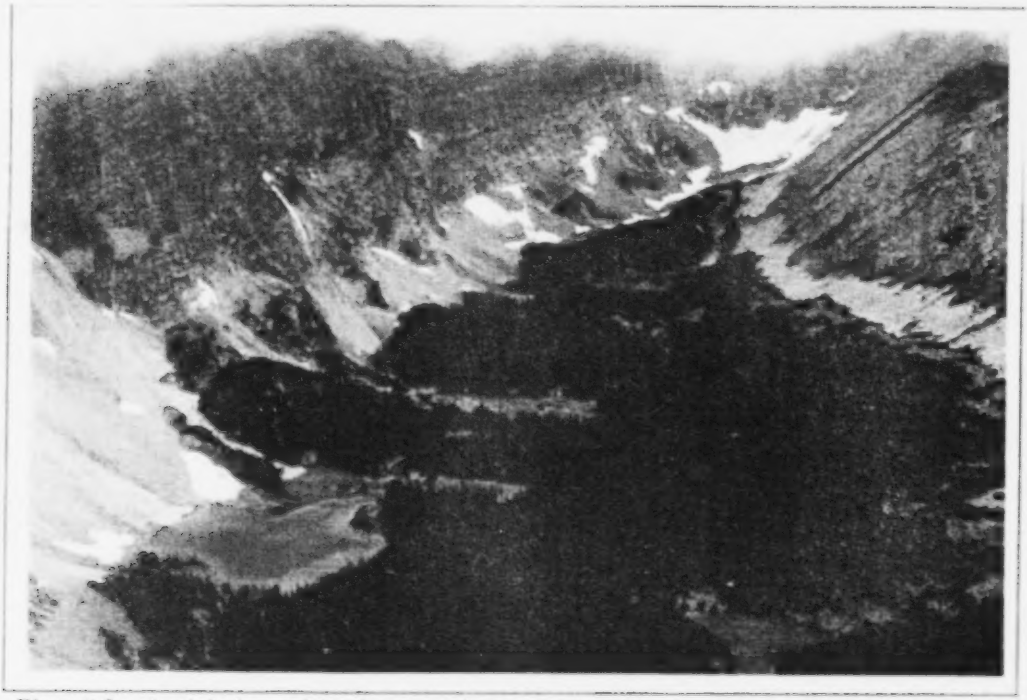


Plate # 2: Aerial view of the three ponds upstream of Unnamed Lake (West Nabesche Lake) that form the headwaters of this system.

LAKE: Unnamed Lake (West Nabesche Lake)

Plate # 3: Panoramic view of Unnamed Lake (West Nabesche Lake) looking east from the center of the lake.

LAKE: Unnamed Lake (West Nabesche Lake)

Plate # 4: Panoramic view of Unnamed Lake (West Nabesche Lake) looking west from the center of the lake.

LAKE: Unnamed Lake (West Nabesche Lake)

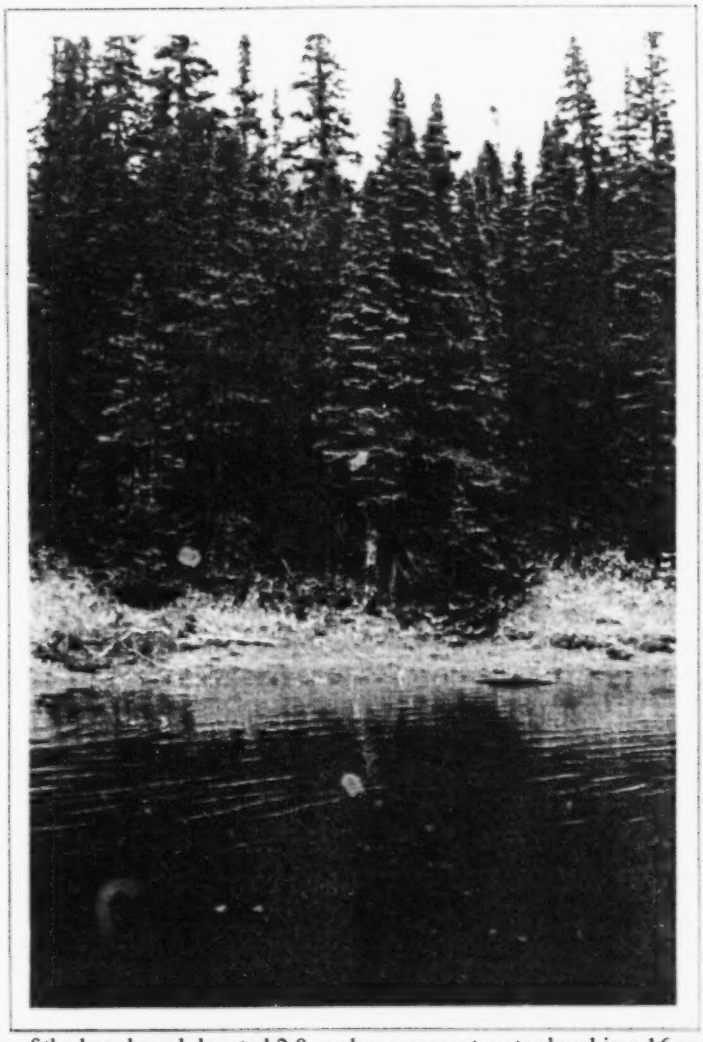


Plate # 5: View of the benchmark located 2.0 m above present water level in a 16 cm diameter fir tree that is 5.0 m from the present water's edge and located approximately 150 m north of Inlet # 1.

LAKE: Unnamed Lake (West Nabesche Lake)

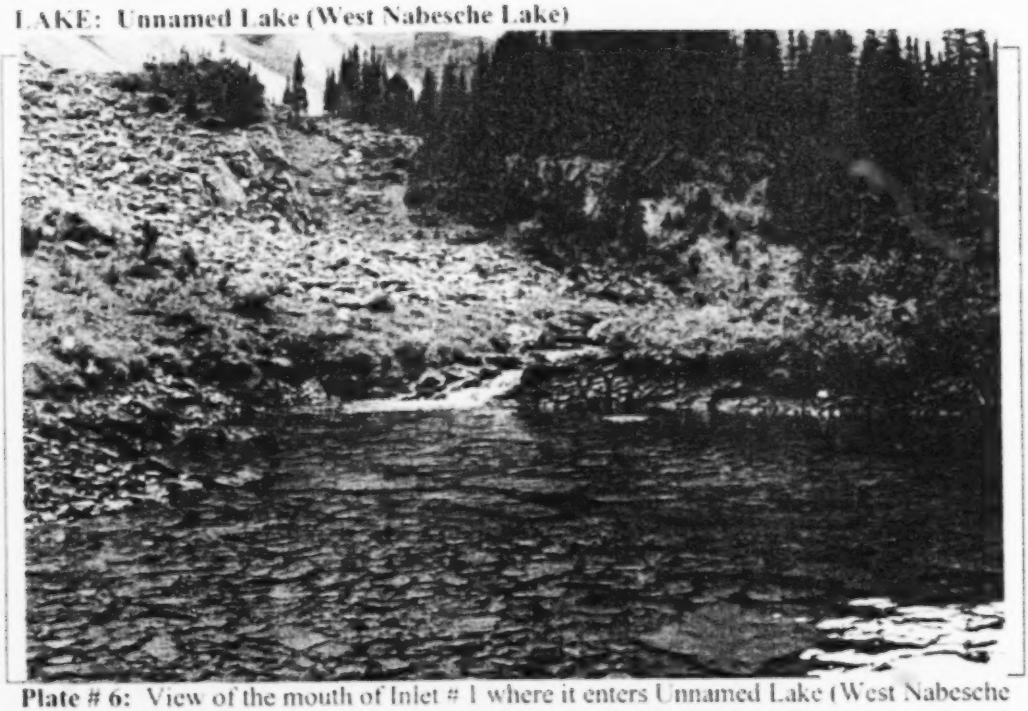


Plate # 6: View of the mouth of Inlet # 1 where it enters Unnamed Lake (West Nabesche Lake) in the west corner of the lake.

Plate # 7: Upstream view of bedrock falls # 1 on Inlet # 1, located approximately 60 m upstream of Unnamed Lake (West Nabesche Lake).

LAKE: Unnamed Lake (West Nabesche Lake)

Plate # 8: Upstream view of bedrock falls # 1 on Inlet # 1, located approximately 60 m upstream of Unnamed Lake (West Nabesche Lake) after a night of rain. Note the amount of flow compared to Plate # 7.

Plate # 9: View of the mouth of the outlet where it drains Unnamed Lake (West Nabesche Lake) from the east end of the lake during times of high water. Note that the lake level would have to rise approximately 0.5 m before water would freely run down the creek channel.

Plate # 10: Downstream view of the dry channel bed of the outlet, taken approximately 50 m downstream of Unnamed Lake (West Nabesche Lake).

Plate # 11: Downstream view of the outlet, taken approximately 85 m downstream of Unnamed Lake (West Nabesche Lake). Note that there is now surface flow in the channel.

Appendix A

LABORATORY REPORT

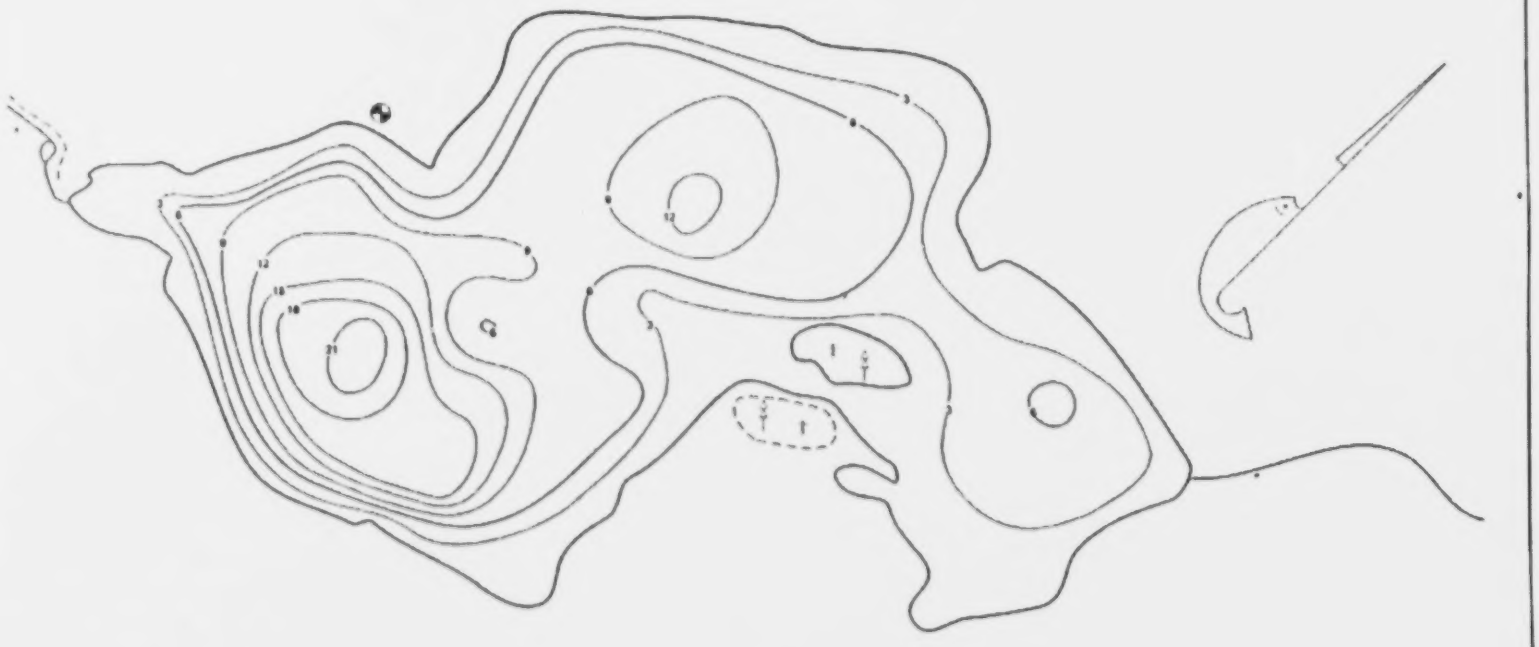
Water Chemistry Analysis

RESULTS FOR UNNAMED LK-WEST NEBESCHE SAMPLES

Parameter Analyzed		Units	964860-001	964860-002
'ALINITY		mg/l	78.4	87.4
IDUCTIVITY		uS/cm	148	176
METALS/TOTAL (WATER-ICP)	AG	mg/l	<.01	-
	AL	mg/l	<.06	-
	AS	mg/l	<.06	-
	B	mg/l	<.01	-
	BA	mg/l	.002	-
	BE	mg/l	<.001	-
	CA	mg/l	17.5	-
	CD	mg/l	<.006	-
	CO	mg/l	<.006	-
	CR	mg/l	.006	-
	CU	mg/l	<.006	-
	FE	mg/l	<.006	-
	K	mg/l	.1	-
	MG	mg/l	9.7	-
	MN	mg/l	.001	-
	MO	mg/l	<.01	-
	NA	mg/l	<.1	-
	NI	mg/l	<.02	-
	P	mg/l	<.1	-
	PB	mg/l	<.06	-
	SB	mg/l	<.06	-
	SE	mg/l	<.06	-
	SI	mg/l	.27	-
	SN	mg/l	<.06	-
	SR	mg/l	.008	-
	TI	mg/l	<.002	-
	V	mg/l	<.01	-
	ZN	mg/l	.005	-
NITROGEN/AMMONIA		mg/l	.006	.007
/NITRITE		mg/l	.004	.002
/NITRITE+NITRATE		mg/l	.044	.083
/TOTAL		mg/l	.09	.14
PH		Rel.U.	8.24	8.07
PHOSPHORUS/O-PO4		mg/l	<.001	<.001
/TOTAL		mg/l	<.002	.003
/TOTAL DISSOLVED		mg/l	<.002	<.002
RESIDUE/FILTERABLE		mg/l	90	100
/NON-FILTERABLE		mg/l	<5	<5
BC CLIENT STUDY CODE			20	20
SAMPLING AGENCY		EMScode	91	91
SITE IDENTIFIER/NUMBER			E223191	E223191
COLLECTION START DATE		y/m/d	96/09/13	96/09/13
UPPER DEPTH		metres	0.5	20.5
TEMPERATURE ON ARRIVAL		deg.C	9	9

Appendix B

BATHYMETRIC MAP



Reduced to
34%
of Original Size

STATISTICS AT TIME OF SURVEY		
Elevation	1425	m ?
Surface Area	388314	sq.m
Area above 6m contour	065040	sq.m
Volume	1818152	cu.m.
Mean Depth	4.1	m.
Maximum Depth	22.6	m.
Perimeter, Mean Shore	3010	m.
Perimeter, Islands	260	m.
Bench Mark	7.0	m.

PREPARED FOR: Ministry of Environment, Lands and Parks
BY Jeordan Robbins
B.C. Conservation Foundation

Unnamed West Nabesche Lake